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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,825	08/14/2008	Sung-Ik Park	51876P1119	8986

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EXAMINER

SHEN, QUN

ART UNIT	PAPER NUMBER
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2617

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07/22/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,825	Applicant(s) PARK ET AL.	
	Examiner QUN SHEN	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6-9 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6-9 and 14-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 6/17/10 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This communication is a Second Action Final on the merits. Claims 1 and 9 are amended. Claims 2-5 and 10-13 are canceled. Claims 1, 6-9, 14-16, after amendment, are currently pending and have been considered below.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objection

2. Claims 6-8 and 14-16 are objected to because of the following informalities:
Claims 6-8 recite "The modulating apparatus as recited in claim 1 or 2...", claims 14-16 recite "The modulating apparatus as recited in claim 9 or 10..." in line 1 of each claim. Claims 2 and 10 have been canceled. Therefore, the dependency of claims 2 and 10 is lack of antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: (*See MPEP Ch. 2141*)

Determining the scope and contents of the prior art;
Ascertaining the differences between the prior art and the claims in issue;
Resolving the level of ordinary skill in the pertinent art; and
Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

3. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA (Applicant Admitted Prior Art (hereinafter AAPA), in view of NPL, "RF Transmitter Architectures and Circuits, IEEE 1999 Custom Integrated Circuits Conference, pp. 10.1.1 – 10.1.8, by Behzad Razavi (hereinafter Razavi).

As to claim 1, AAPA discloses a modulating apparatus of an on-channel repeater which receives the signal on one channel and distributes the signal on the same channel (AAPA: Figs 1-2; page 1, lines 24- 33 page 2, lines 7-17), comprising:
a baseband signal configuring means for configuring a baseband signal by combining an input field and a segment sync signal (AAPA: Fig 3: 310; page 3, lines 1-17);
a pilot adding means for adding a pilot signal to the baseband signal (AAPA: Fig 3: 320; page 3, lines 1-17);
an Up-sampling means for up-sampling the baseband signal with the pilot signal added thereto (AAPA: Fig 3: 330);
a filtering means for filtering the up-sampled baseband signal with the pilot signal added thereto, wherein the filtering means generates an in-phase (I) signal and a quadrature (Q) signal and performs filtration (AAPA: Fig 3: 340; page 3, lines 1-28); AAPA also

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discloses digital to analog converting means (Fig 3, 370), but does not expressly disclose a first digital-to-analog converting means for converting the filtered in-phase (I) signal into a first analog signal; a second digital-to-analog converting means for converting the filtered quadrature (Q) signal into a second analog signal; a first radio frequency (RF) up-converting means for directly up-converting the first analog signal into a first RF signal; a second radio frequency (RF) up-converting means for directly up-converting the second analog signal into a second RF signal; an adding means for adding the up-converted first and second analog signals.

Razavi, however, teaches disclose a first digital-to-analog converting means for converting the filtered in-phase (I) signal into a first analog signal; a second digital-to-analog converting means for converting the filtered quadrature (Q) signal into a second analog signal (Fig 6, digital to analog converter DAC, Fig 16, where baseband signals I and Q are analog signals after the digital to analog conversion); a first radio frequency (RF) up-converting means for directly up-converting the first analog signal into a first RF signal (Fig 16, direct conversion for I signal); a second radio frequency (RF) up-converting means for directly up-converting the second analog signal into a second RF signal (Fig 16, direct conversion for Q signal); an adding means for adding the up-converted first and second analog signals (Fig 16, adder to add I and Q signals after direct up-conversion, also see III. Transmitter Architectures, page 200).

Therefore, consider AAPA and Razavi's teachings as a whole, it would have been obvious to one of the skill in the art at the time of invention to incorporate Razavi's

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direct conversion teachings to AAPA's apparatus as a complete RF modulator for the benefit of providing a cost efficient direct conversion (or zero-IF) RF transmitter, which is commonly used in wireless transceiver design.

As to claim 9, claim 9 is a method claim that is encompassed and necessitated by apparatus claim 1. Rejection of claim 1 is therefore incorporated herein (see analysis and rejection above).

4. Claims 6-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, in view of Razavi and US 6,658,261 B1, Winters et al. (hereinafter Winters).

As to claim 6, AAPA as modified discloses the modulating apparatus as recited in claim 1 or 2 but does not disclose the filtering means includes an Equi-Ripple (ER) filter and uses a window method. Winters, however, teaches using Parks-McClellan optimal equiripple filter as a low pass filter with appropriate windowing type and length for improving wireless communication performance under fading environment (Winters: col 4, lines 25 – 37). Therefore, consider AAPA as modified and Winters teachings together, it would have been obvious to one of skill in the art at the time of invention to further modify AAPA as modified's modulation apparatus by incorporating Winters's teachings on equiripple filter and appropriate windowing response to improve the performance of wireless communication system with reduced group delay under fading environment.

As to claim 7, AAPA as modified discloses the modulating apparatus as recited in

claim 1 or 2, wherein the filtering means includes an ER filter (see analysis of claim 6).

As to claim 8, AAPA as modified discloses the modulating apparatus as recited in claim 1 or 2, wherein the filtering means includes a square root raised cosine (SRRC) filter and uses a window method (AAPA: line 11, lines 29-34, pg 3. It would have been obvious to one of skill in the art to apply window method taught by Winters with SRRC filter, see claim 6 for motivation).

As to claims 14 – 16, the claims are rejected with the same reason set forth for claims 6-8, respectively (see analysis and rejections of claims 6-8 above).

Response to Argument

5. Applicant's arguments filed on June 17, 2010 are fully considered but they are moot in view of new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUN SHEN whose telephone number is (571)270-7927. The examiner can normally be reached on Monday through Thursday, 9:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LunYi Lao can be reached on 571-272-7671. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/QUN SHEN/

/Lewis G. West/

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Examiner, Art Unit 2617

Supervisory Patent Examiner, Art
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